Curriculum Vitae

(1) Name: Martin G. Mlynczak
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(3) History of employment

Systems and Applied Sciences Corp., at NASA LaRC, 1984-1985 – Research Scientist
College of William and Mary, at NASA LaRC, 1985-1986 – Research Associate
NASA Langley Research Center (1986 – present) – Senior Research Scientist
College of William and Mary (1995-2000) – Adjunct Professor of Applied Science
Christopher Newport University (2016 – present) – Adjunct Professor of Physics/Capstone Mentor

(4) Degrees

Ph. D., Atmospheric Science, University of Michigan, 1989.
M. S., Meteorology, University of Wisconsin, 1984.
B. S., Physics, *Summa Cum Laude*, University of Missouri, 1981.

(5) Research Experience

Space flight mission instrument development, algorithm development, and data interpretation, thermosphere to troposphere; Infrared, visible, and ultraviolet radiative transfer calculation under non-LTE conditions and application to remote sensing and energy budget of mesosphere and lower thermosphere (MLT); Kinetic and spectroscopic requirements for non-LTE radiative transfer models. Architect of SABER and TIMED mission measurement strategy, SABER instrument channel selection, and data product generation approach; Algorithms for SABER O_3, $O_2(^1\Delta)$, O, H, chemical heating rates, and solar heating rates; Leading and facilitating use of SABER and related data with broad section of MLT community; Energy budget of the stratosphere. Development of new, accurate infrared spaceflight instruments and related technologies (detectors, optics) and techniques for measuring trends in atmospheric state and climate variables; Develop and proposal of new flight mission concepts for MLT. Far-infrared radiative transfer and spaceflight instruments for measurement of climate change. Space weather on Earth as analog for exoplanetary space weather and search for habitable planets.

Notable discoveries: Primacy of exothermic chemical reactions in the MLT energy budget; Role of airglow in reducing heating due to absorption of solar UV in MLT; the "natural thermostat" of nitric oxide and carbon dioxide in thermosphere energy budget during recovery from geomagnetic storm events; energetic constraints on atomic oxygen in MLT; effectively constant geoeffective solar energy output independent of solar cycle strength/length; relative roles of thermospheric radiative cooling by NO and CO_2 over a solar cycle; Harmonics of solar rotation period in MLT energy budget due to high speed solar wind streams; Critical adjustments to water vapor spectroscopy in the troposphere. Creator of Thermosphere Climate Index.

- Associate Principal Investigator, SABER instrument, 1994 – present
- Principal Investigator, METEORS suborbital rocket project, 1996-2000
- Co-Investigator, Ice Content of Noctilucent Clouds suborbital rocket project (1999 launch)
- Co-Investigator, Cryogenic Whole Air Sampling suborbital rocket project (2002 launch)
- Guest Investigator, Upper Atmosphere Research Satellite, 1996-1999
- Project Scientist-Infrared, CLARREO satellite project, 2008-2018
- Co-Investigator, AIRS and CERES instruments, EOS Aqua Satellite, 2004-2008
- Co-Investigator, GERB instrument (EUMETSAT, 1995-2000)
- Principal Investigator, Far-Infrared Spectroscopy of the Troposphere project, 2001-2015
- Principal Investigator, INFLAME, CORSAIR, FIREBIB, FIDTAP; NASA instrument technology development projects (all via competed proposals, years 2001 to 2012)

- Co-Investigator and Mission Advisory Group, Far-Infrared Outgoing Radiation Understanding and Monitoring (FORUM) satellite mission, European Space Agency, 2017-present

(6) Honors

- Curator's Scholar, University of Missouri, 1977-1981
- Rhodes Scholarship Candidate, 1980
- Dean's List, all semesters, University of Missouri–St. Louis, 1977-1981
- Outstanding Graduate Student Award, University of Michigan, 1988
- Affiliate Scientist, NCAR High Altitude Observatory, 2000-present
- Alumni Society Merit Award, College of Engineering, *University of Michigan*, 2004
- World Meteorological Organization *Norbert Gerbier-Mumm Award*, 2005
- Distinguished Alumnus Award, *University of Missouri–St. Louis, Dept. of Physics*, 2006
- Distinguished Alumnus Award, *University of Missouri–St. Louis*, 2007
- Marcus O'Day Memorial Award, for best paper, *Air Force Research Laboratory*, 2009
- NASA Distinguished Service Medal, 2012 (*This is the highest honor NASA bestows*)
- NASA Exceptional Service Medal, 2009
- NASA Exceptional Scientific Achievement Medal, 2003
- Eight (8) NASA Group Achievement Awards
- NASA Langley H.J.E. Reid Award, Best Center-wide Research Publication, 2015 and 1995
- NASA Langley J.D. Lawrence Award, Best Science Directorate Publication, 2010; 2015
- NASA Langley Floyd Thompson Fellowship, 1998-1999 (Sabbatical at NCAR HAO)
- Two (2) NASA Langley Team Awards (FORGE and INFLAME Projects, 2010)
- NASA Langley Center Director's Award, 2012
- Eight (8) NASA Langley Certificates of Outstanding Performance
- Fourteen (14) NASA Langley Superior Accomplishment Awards

(7) Memberships

- American Geophysical Union; Sigma Xi; The Honor Society of Phi Kappa Phi

(8) Community Service and Outreach

- NASA Geospace Dynamics Constellation Mission Science & Technology Definition Team, 2018/19
- NASA Pathways to Mission Leadership PI Diversity Workshop Planning Committee, 2018
- AGU Nominations Task Force, 2018-present
- Associate Editor, Journal of Geophysical Research-Space Physics, 2001-2009
- Group Leader, SCOSTEP CAWSES project, 2003-2008
- Group Member, SCOSTEP CAWSES-II project, 2009-2013
- Group Member, SCOSTEP VarSITI project, 2014-2018
- Scientific Advisory Committee, NCAR High Altitude Observatory, 2001-2011
- NASA Scientific Balloon Working Group, 2005-2018
- Committee on the Middle Atmosphere, American Meteorological Society, 2004-2007
- Reviewer for JGR-Space Physics; JGR-Atmospheres; GRL; Space Weather; J. Atmos. Science; J. Climate; J. Quantitative Spectroscopy and Radiative Transfer; JASTP; Applied Optics; Atmospheric Chemistry and Physics (EGU); NASA; NSF; NERC (UK)
- AGU Meetings Convener, most recent: TESS (2018); AGU (2014, 2015, 2016, 2018)
- Industrial Advisory Board, Embry-Riddle Aeronautical University, 2016 – present
- Host for university faculty member sabbatical leaves at NASA Langley
- Mentor, Langley Aerospace Research Summer Scholars Program (Undergraduate interns)
- Doctoral Committee Chair, College of William and Mary, Williamsburg, VA, 1995-2000
- Capstone Project Mentor, Christopher Newport University, 2018-2019
- Lead author of multiple white papers submitted to the 2007 and 2017 Earth Science Decadal Surveys and to the 2013 Heliophysics Decadal Survey
- Press conferences at Fall AGU Meetings: 2008, 2009, 2013
- YouTube Video on Solar Storms of 2012